

A COLLECTION OF HYDROIDS FROM MOÇAMBIQUE, EAST AFRICA

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(With 9 figures)

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INTRODUCTION

This paper is the second part of an account of the collection made by the second author and his colleagues during expeditions to the Seychelles in 1960 and to the east coast of Africa in 1969. The hydroids of the Seychelles, which comprised the first part, are described by Millard & Bouillon (1973).

Most of the collection comes from the southern part of Moçambique: from Inhaca Island and Ilha dos Portugueses, which lie to the east of Lourenço Marques in Delagoa Bay, but there is also material from Santa Carolina, a small island further north between the larger Ilha do Bazaruto and the mainland. The area thus lies on the border of the tropics and is in general under the influence of the warm southward-flowing Moçambique current, although the temperature of the coastal waters is somewhat less due to the presence of an inshore northward-flowing counter-current. Macnae & Kalk (1958) give a temperature of approximately 26°C for the Moçambique current and 20°C for the eastern shores of Inhaca Island, whereas the water in Delagoa Bay itself tends to be warmer due to the heating of the sun during the day.

The position of the collecting stations is listed as follows:

Inhaca, Station. On the west coast of Inhaca Island. 26°03'S/32°54'E.

Inhaca, Barreira Vermelha. On the west coast of Inhaca Island.
26°02'S/32°54'E.

Ilha dos Portugueses. An island to the north-west of Inhaca Island, in Delagoa Bay. 25°58'S/32°55'E.

Inhaca Est.

Inhaca, Saco. A bay on the south coast of Inhaca Island. 26°03'S/32°56'E.

Cabo da Inhaca. The most north-easterly point of the island. 25°58'S/32°59'E.

Inhaca Est (dragage, 10–15 m).

Inhaca, Ponta Torres. The most south-easterly point of the island. 26°05'S/32°57'E.

Santa Carolina. An island further north on the coast of Moçambique. 21°37'S/35°20'E.

An account of the marine ecology of Inhaca Island will be found in Macnae & Kalk (1958), while some of the hydroids from the area were described by Millard (1958, 1959).

Since many of the species from southern Africa have already been described or are too well known to warrant description, only certain ones are described in detail and illustrated. All are recorded in the list which follows. As in the previous paper, unidentifiable material is not recorded.

The expedition was financed by the Université Libre de Bruxelles, the Musée Royal de l'Afrique Centrale (Tervuren), the Centre Belge d'Océanographie and the Belgian Ministry of Education and Culture.

The collection is the property of the Musée Royal de l'Afrique Centrale, where the type of the single new species has been deposited.

LIST OF MATERIAL AND LOCALITIES

*Species marked with an asterisk are described or discussed in the systematic section.

†Species marked with a dagger are new records for Africa south of 20°S. Lat.

Family **Myriothelidae**

Myriothela sp.

Santa Carolina: a single infertile specimen 0,8 mm in total height.

Family **Tubulariidae**

**Ectopleura bethae* (Warren, 1908)

Inhaca: a rich, fertile colony.

Zyzyzus solitarius (Warren, 1906)

Cabo da Inhaca: several hydranths, one fertile, growing in a sponge.

Santa Carolina: one fertile hydranth in sponge.

Family **Cladocorynidae**

**Cladocoryne floccosa* Rotch, 1871

Ilha dos Portugueses: a rich fertile colony on *Dynamena crisioides*.

Inhaca, Saco: an infertile colony on *Lytocarpus philippinus*.

Inhaca, Ponta Torres: a rich colony with a few fertile hydranths.

Family **Halocordylidae***Halocordyle disticha* (Goldfuss, 1820)

Inhaca, Ponta Torres: stems reaching 56 mm, some with young gonophores.

Santa Carolina: fertile stems reaching 35 mm.

Family **Corynidae****Coryne ?pusilla* Gärtner, 1774.

Inhaca Est: an infertile colony on weed.

Inhaca, Ponta Torres: infertile colonies.

**Sphaerocoryne bedoti* Pictet, 1893

Santa Carolina: a single infertile hydranth detached from substratum.

Family **Cladonemidae**†? *Cladonema* sp.

Inhaca: three young, infertile hydranths reaching 0,8 mm.

Family **Solanderiidae**† *Solanderia minima* (Hickson, 1903)

Santa Carolina: an infertile colony 70 mm in height and 70 mm in spread.

Family **Zanclidae**†* *Zanclia* sp.

Inhaca, coral reef west of Station: an infertile colony commensal on a coral (colony 1).

Inhaca, coral reef west of Station: a fertile colony from coral reef, growing with a polyzoan (colony 2).

Inhaca, Barreira Vermelha: two colonies, one fertile, on polyzoan (colonies 3 and 4).

Family **Clavidae***Corydendrium parasiticum* (Linnaeus, 1767)

Inhaca, Station: an infertile colony reaching 46 mm.

Inhaca Est: a young colony reaching 8 mm.

Inhaca, Saco: a rich, but infertile, colony reaching 56 mm.

Inhaca, Ponta Torres: rich, but infertile, colonies reaching 59 mm.

†* *Rhizogeton nudum* Broch, 1909

Inhaca, Station: a fertile colony on weed.

Ilha dos Portugueses: a few infertile hydranths.

Santa Carolina: a few infertile hydranths.

†* *Turritopsis nutricula* (McCrary, 1856)

Inhaca, Station: a young, infertile colony.

Inhaca Est (dragage): a few young hydranths.

Santa Carolina: several small colonies, one with young medusae.

Family **Cytaeidae***Cytaeis nassa* (Millard, 1959)Ilha dos Portugueses: fertile colonies on shells of *Nassa fenestrata*.

Family **Eudendriidae**

**Eudendrium capillare* Alder, 1856

Inhaca, Barreira Vermelha: one infertile colony.

Cabo da Inhaca: one infertile colony.

Inhaca, Ponta Torres: three fertile colonies.

Santa Carolina: one infertile colony.

†**Eudendrium motzkossowskiae* Picard, 1951

Inhaca, Saco: one infertile colony.

Inhaca, Ponta Torres: three colonies, two male and one infertile.

Santa Carolina: one infertile colony.

**Eudendrium ramosum* (Linnaeus, 1758)

Inhaca Est: four colonies, three of them fertile.

Inhaca, Saco: one infertile colony.

Cabo da Inhaca: one infertile colony.

Inhaca, Ponta Torres: eight colonies, five of them fertile.

Family **Hydractiniidae**

**Hydractinia diogenes* Millard, 1959

Inhaca, Station: a fertile colony on hermit shell.

Inhaca, Ponta Torres: a fertile colony on empty shell.

**Podocoryne ?carnea* M. Sars, 1846

Inhaca Est (dragage): a female colony on weed.

*Incertae sedis (1)

Inhaca Est (dragage): a few minute hydranths on polyzoan.

*Incertae sedis (2)

Inhaca, Barreira Vermelha: an infertile colony.

†*Incertae sedis (3) *Lineolaria* sp.

Inhaca, Barreira Vermelha: an infertile colony.

Family **Aequoreidae**

Aequorea africana Millard, 1966

Ilha dos Portugueses: an infertile colony with a few contracted hydranths.

Family **Calicellidae**

†*Egmondella amirantensis* Millard & Bouillon, 1973

Inhaca, Station: two infertile colonies.

Ilha dos Portugueses: infertile colonies on *Dynamena crisioides*.

Santa Carolina: an infertile colony on *Dynamena crisioides*.

Family **Haleciidae**

Halecium halecinum (Linnaeus, 1758)

Inhaca Est (dragage): a small female colony reaching 4 mm, on weed.

Halecium inhacae Millard, 1958

Inhaca, Station: a fertile colony reaching 4 mm.

Inhaca Est: fertile colonies on weed, reaching 3 mm.

Inhaca, Ponta Torres: rich fertile colonies on weed, reaching 3,5 mm.

Halecium lankesteri (Browne, 1890)

Santa Carolina: a small male colony reaching 2,6 mm, on worm tubes and other hydroids, and a rich female colony reaching 1,5 mm, on weed.

**Halecium tenellum* Hincks, 1861

Ilha dos Portugueses: an infertile colony reaching 3 mm.

Cabo da Inhaca: fertile colonies reaching 5 mm.

Inhaca Est (dragage): an infertile colony reaching 5 mm.

Inhaca, Ponta Torres: a rich fertile colony reaching 3 mm.

†**Hydrodendron gardineri* (Jarvis, 1922)

Cabo da Inhaca: several infertile colonies on the ascidian *Pyura* and on the mussel *Perna perna*.

**Hydrodendron sympodiiformis* n. sp.

Inhaca, Ponta Torres: a very rich fertile colony on weed.

Family **Campanulariidae***Campanularia crenata* (Hartlaub, 1901)

Inhaca, Station: an infertile colony on weed.

Inhaca, Barreira Vermelha: a fertile colony on weed.

Inhaca, Ponta Torres: a rich fertile colony on weed.

**Campanularia delicata* (Trebilcock, 1928)

Cabo da Inhaca: fertile colonies on weed.

Inhaca Est (dragage): an infertile colony on weed.

Campanularia integra MacGillivray, 1842

Inhaca Est: rich fertile colonies on weed.

Inhaca Est (dragage): a rich fertile colony on weed.

Inhaca, Ponta Torres: rich fertile colonies on weed.

Campanularia laminacarpa Millard, 1966

Cabo da Inhaca: an infertile colony epizootic on *Thyroscyphus aequalis*.

Campanularia morgansi Millard, 1957

Cabo da Inhaca: fertile colonies on *Pyura* and *Perna perna*.

Clytia gravieri (Billard, 1904)

Inhaca, Station: two colonies, one fertile, with branched and stolonial stems.

Inhaca, Barreira Vermelha: a fertile colony with stolonial and slightly branched stems, on weed.

Ilha dos Portugueses: an infertile stolonial colony.

Cabo da Inhaca: slightly branched stems with one gonotheca.

Inhaca, Ponta Torres: slightly branched infertile stems reaching 14 mm.

Santa Carolina: several stolonial colonies on weed, some fertile.

Clytia hemisphaerica (Linnaeus, 1767)

Inhaca, Station: several colonies, some fertile, with gonothecae of the *johnstoni* type.

Inhaca, Barreira Vermelha: fertile colonies on weed with gonothecae of the *johnstoni* type.

Ihla dos Portugueses: fertile colonies on weed with gonothecae of the *johnstoni* type.

Cabo da Inhaca: two infertile colonies.

Inhaca Est (dragage): infertile colonies on weed.

Inhaca, Ponta Torres: several infertile colonies.

Santa Carolina: several colonies on weed, one fertile, with gonothecae of the *johnstoni* type.

†*Clytia latitheca* Millard & Bouillon, 1973

Cabo da Inhaca: a small infertile colony reaching 6 mm.

Clytia paulensis (Vanhöffen, 1910)

Inhaca, Saco: an infertile colony epizootic on *Lytocarpus philippinus*.

**Clytia* sp.

Inhaca Est (dragage): a small infertile colony on weed.

Obelia bicuspidata Clarke, 1875

Inhaca, Station: infertile stems reaching 4 mm, on weed.

Ihla dos Portugueses: infertile stems reaching 5 mm.

Obelia dichotoma (Linnaeus, 1758)

Ihla dos Portugueses: rich fertile colonies reaching 9 mm, on weed and epizootic on *Dynamena crisioides*.

Cabo da Inhaca: infertile colonies reaching 8 mm.

Inhaca, Ponta Torres: rich fertile colonies reaching 7 mm, on weed.

Santa Carolina: an infertile colony reaching 7 mm.

Obelia geniculata (Linnaeus, 1758)

Inhaca, Station: a rich infertile colony on weed.

Inhaca Est: rich fertile colonies reaching 6 mm, on weed.

Cabo da Inhaca: a fertile colony on a gastropod shell.

Inhaca, Ponta Torres: fertile colonies reaching 5 mm, on weed.

Family Lafoeidae

Hebella furax Millard, 1957

Inhaca, Barreira Vermelha: an infertile colony epizootic on *Halopteris polymorpha*.

Ihla dos Portugueses: an infertile colony epizootic on *Halopteris polymorpha*.

Hebella scandens (Bale, 1888)

Ihla dos Portugueses: infertile colonies epizootic on *Dynamena crisioides* and *D. cornicina*.

Cabo da Inhaca: an infertile colony epizootic on *Dynamena quadri-dentata*.

Inhaca Est (dragage): a rich colony epizootic on *Sertularia linealis*, with a few gonothecae.

Inhaca, Ponta Torres: an infertile colony epizootic on *Dynamena crisioides*.

Santa Carolina: infertile colonies epizootic on *Dynamena crisioides*.

**Scandia mutabilis* (Ritchie, 1907)

Inhaca Est: an infertile colony epizootic on *Eudendrium ramosum*.

Cabo da Inhaca: infertile colonies epizootic on various hydroids.

Inhaca, Ponta Torres: infertile colonies epizootic on *Halocordyle disticha*, *Eudendrium ramosum* and *Idiellana pristis*.

Family **Synthechiidae***Hincksella corrugata* Millard, 1958

Inhaca Est (dragage): one infertile stem of 3 mm.

Santa Carolina: an infertile colony reaching 10 mm.

Synthecium ?elegans Allman, 1872

Santa Carolina: five infertile stems reaching 15 mm.

Family **Sertulariidae****Abietinaria laevimarginata* (Ritchie, 1907)

Ihla dos Portugueses: fertile colony on weed.

Inhaca Est (dragage): infertile colonies on weed.

Amphisbetia minima (D'Arcy Thompson, 1879)

Inhaca Est: rich fertile colonies reaching 3 mm, on weed.

Inhaca Est (dragage): an infertile colony reaching 2,5 mm, on weed.

Inhaca, Ponta Torres: rich fertile colonies reaching 3 mm, on weed.

†**Diphasia digitalis* (Busk, 1852)

Inhaca Est: a branched stem of 7 mm and three smaller unbranched ones, all infertile.

Inhaca, Ponta Torres: infertile branched and unbranched stems reaching 44 mm.

**Diphasia tetraglochina* Billard, 1907

Inhaca Est: an infertile colony reaching 2,5 mm, on weed.

Cabo da Inhaca: an infertile colony reaching 7 mm.

Inhaca Est (dragage): an infertile colony reaching 3 mm, on weed.

Dynamena cornicina McCrady, 1858

Ihla dos Portugueses: unbranched fertile stems reaching 4 mm.

Inhaca Est: two unbranched infertile stems reaching 9 mm.

Santa Carolina: several branched infertile stems reaching 60 mm, and two rich fertile colonies with unbranched stems reaching 9 mm.

**Dynamena crisioides* Lamouroux, 1824

Ihla dos Portugueses: many tall infertile stems of var. *gigantea* reaching 159 mm.

Inhaca, Saco: two infertile stems of normal variety reaching 13 mm.

Inhaca, Ponta Torres: infertile stems of normal variety reaching 20 mm.

Santa Carolina: many stems, reaching 160 mm, some fertile, including normal variety, var. *gigantea* and var. *alternata*.

Dynamena obliqua Lamouroux, 1816

Inhaca Est (dragage): an infertile colony reaching 11 mm, on weed.

Inhaca, Ponta Torres: infertile stems reaching 4 mm, on weed.

Dynamena quadridentata (Ellis & Solander, 1786)

Ihla dos Portugueses: a fertile female colony reaching 6 mm, on weed.

Inhaca, Saco: infertile stems reaching 5 mm.

Cabo da Inhaca: infertile stems reaching 7 mm, on *Pyura*, *Perna perna* and weed.

Inhaca Est (dragage): infertile stems reaching 5 mm, on weed.

Inhaca, Ponta Torres: infertile stems reaching 4 mm, on weed.

Santa Carolina: infertile stems reaching 3 mm, on weed.

Idiellana pristis (Lamouroux, 1816)

Inhaca, Station: several young colonies reaching 21 mm, on a bivalve.

Inhaca, Barreira Vermelha: two infertile stems reaching 19 mm.

Inhaca, Ponta Torres: infertile stems reaching 52 mm.

Santa Carolina: two infertile stems reaching 45 mm.

Sertularella mediterranea asymmetrica Millard, 1958

Inhaca Est: a fertile colony reaching 6 mm.

Inhaca, Ponta Torres: a fertile colony reaching 7 mm, on weed.

Sertularia distans (Lamouroux, 1816)

Inhaca, Station: unbranched stems reaching 12 mm, some fertile, on weed and a shell.

Inhaca, Ponta Torres: unbranched, infertile stems reaching 4 mm, on weed.

Santa Carolina: unbranched, infertile stems reaching 4 mm, on weed.

Sertularia ligulata Thornely, 1904

Inhaca, Station: infertile stems reaching 27 mm.

Inhaca Est (dragage): infertile stems reaching 8 mm, on weed.

Santa Carolina: infertile stems reaching 10 mm.

**Sertularia longa* (Millard, 1958)

Ihla dos Portugueses: fertile colonies reaching 3 mm, on weed.

Inhaca Est (dragage): infertile colonies on weed.

**Sertularia marginata* (Kirchenpauer, 1864)

Inhaca, Ponta Torres: infertile stems reaching 16 mm.

Sertularia turbinata (Lamouroux, 1816)

Inhaca, Station: an infertile colony reaching 6 mm.

Thyroscyphus aequalis Warren, 1908

Cabo da Inhaca: several infertile stems reaching 39 mm.

Thyroscyphus fruticosus (Esper, 1793)

Inhaca, Station: fertile fragments reaching 50 mm.

Family **Plumulariidae***Antennella secundaria* (Gmelin, 1791)

Inhaca Est: infertile stems reaching 5 mm.

Inhaca, Saco: infertile stems reaching 12 mm.

Inhaca, Ponta Torres: stems reaching 10 mm, some fertile.

Santa Carolina: stems reaching 8 mm, some fertile.

† *Dentitheca bidentata* (Jäderholm, 1920)

Inhaca, Barreira Vermelha: infertile stems reaching 11 mm.

Halopteris glutinosa (Lamouroux, 1816)

Inhaca Est: many stems, some fertile, reaching 17 mm.

Inhaca, Ponta Torres: stems reaching 18 mm, some fertile.

Halopteris polymorpha (Billard, 1913)

Inhaca Station: fertile stems reaching 11 mm.

Inhaca, Barreira Vermelha: an infertile stem of 9 mm.

Ihla dos Portugueses: stems reaching 16 mm, some fertile.

Inhaca, Ponta Torres: an infertile stem of 16 mm.

Santa Carolina: many infertile stems reaching 22 mm.

Kirchenpaueria irregularis (Millard, 1958)

Santa Carolina: two infertile colonies with fascicled branched stems reaching 13 mm.

† *Monostaechas quadridens* (McCrary, 1857)

Cabo da Inhaca: stems reaching 13 mm, some fertile, on *Pyura*, *Perna perna* and a sponge.

Inhaca, Ponta Torres: infertile stems reaching 8 mm.

Santa Carolina: many infertile stems reaching 13 mm.

Oswaldella nova (Jarvis, 1922)

Santa Carolina: infertile colonies epizootic on *Halopteris polymorpha*.

Plumularia filicaulis Kirchenpauer, 1876

Inhaca Est: fertile stems reaching 5 mm, on weed.

Inhaca Est (dragage): an infertile colony reaching 2,5 mm, on weed.

Inhaca, Ponta Torres: fertile colonies reaching 5 mm, on weed.

†* *Plumularia obliqua* (Johnston, 1847)

Inhaca Est: an infertile colony reaching 4 mm, on weed.

Inhaca Est (dragage): an infertile colony reaching 5 mm, on weed.

† *Plumularia pennycuikae* Millard & Bouillon, 1973

Santa Carolina: two infertile colonies reaching 13 mm.

Plumularia setacea (Linnaeus, 1758)

Cabo da Inhaca: abundant fertile stems reaching 22 mm, on *Perna perna*, sponges and other substrata.

Santa Carolina: fertile stems reaching 20 mm.

† *Plumularia strictocarpa* Pictet, 1893

Santa Carolina: several fertile colonies reaching 10 mm.

Plumularia warreni Stechow, 1919

Inhaca, Ponta Torres: a fertile colony reaching 5 mm, on weed.

Santa Carolina: fertile colonies reaching 15 mm.

Plumularia wasini Jarvis, 1922

Santa Carolina: an infertile colony reaching 13 mm.

Pycnotheca mirabilis (Allman, 1883)

Inhaca, Barreira Vermelha: infertile stems reaching 13 mm.

Inhaca Est (dragage): two infertile stems reaching 6 mm.

Inhaca, Ponta Torres: a fertile colony reaching 14 mm.

†**Aglaophenia cupressina* Lamouroux, 1816

Santa Carolina: several fertile colonies reaching 260 mm.

Gymnangium gracilicaule gracilicaule (Jäderholm, 1903)

Inhaca, Station: an infertile colony reaching 94 mm.

**Gymnangium gracilicaule lignosum* (Millard, 1968)

Santa Carolina: several infertile stems reaching 35 mm.

Lytocarpus philippinus (Kirchenpauer, 1872)

Inhaca, Station: infertile colonies reaching 41 mm, on weed.

Ihla dos Portugueses: one infertile stem of 104 mm.

Inhaca, Saco: luxurious infertile stems reaching 147 mm.

Inhaca, Ponta Torres: luxurious infertile stems reaching 112 mm.

Santa Carolina: infertile fragments and young colonies.

†*Thecocarpus delicatulus* (Busk, 1852)

Santa Carolina: infertile stems reaching 30 mm.

Family **Proboscidiactylidae**†**Proboscidiactyla* (*Lar*) sp.

Inhaca, Barreira Vermelha: five colonies, one fertile.

SYSTEMATIC SECTION

Family **Tubulariidae***Ectopleura bethae* (Warren, 1908)

Tubularia betheris Warren, 1908: 280; pl. 45, figs 10, 11; pl. 46, fig. 12.

Description

A colony of many individuals reaching a maximum height of 30 mm. Perisarc smooth or irregularly annulated in some areas, stiff to about 0,5 mm below hydranth body, then becoming thin and membranous and terminating on the basal dilation. Mature hydranth about 1,5 mm in height to tip of hypostome, with up to 15 aboral tentacles and 17 oral tentacles. Aboral tentacles reaching 1,8 mm, oral tentacles reaching 0,5 mm.

In the young hydranth the oral tentacles are definitely capitate with a terminal battery of nematocysts. In the mature one the capituli are no longer distinct but there is still a concentration of nematocysts on the distal end. The smallest hydranth present is 0,42 mm in height and has nine filiform aboral tentacles 0,24 mm long, and nine capitate oral tentacles 0,07 mm long.

Medusa-buds borne on branching blastostyles just above the aboral tentacles, the largest 0,24 mm in height and 0,23 mm in diameter, with four capitate

marginal tentacles 0,06 mm in length and eight exumbrellar bands of nematocysts. In all of them the hypostome is large and fills the umbrellar cavity, and in a few it protrudes through the mouth aperture. It has a circle of nematocysts around the rim.

Remarks

This species resembles *Ectopleura dumortierii* (Van Beneden) in the presence of four medusa tentacles, but differs from it in the smaller number of hydranth tentacles and in the capitate tentacles of the young hydranth.

Family Cladocorynidae

Cladocoryne floccosa Rotch, 1871

Fig. 1 D, E

Cladocoryne floccosa: Warren, 1908: 284. Behner, 1914: 419, figs 19–23. Philbert, 1936: 1, figs 1–8. Weill, 1937: 1, figs 1–4. Vervoort, 1941: 190. Brinckmann-Voss, 1970: 69, figs 80–82.

Description

Stems unbranched or rarely with one lateral branch, reaching a maximum height of 5,0 mm. Perisarc smooth, or annulated in basal region only. Hydranths with 4–7 oral tentacles and up to 18 branched aboral tentacles.

Male gonophores borne on hydranths amongst the aboral tentacles, these hydranths showing no signs of regression to gonozooids as described by Behner. Gonophores spherical, reaching 0,34 mm in diameter.

Nematocysts of three types:

- (i) Macrobasic euryteles, found on body of hydranth only (Fig. 1 E). Capsule bean-shaped, $28,8\text{--}31,2 \times 11,7\text{--}15,0 \mu$. Butt in two sections, the first unarmed, the second armed with spiral bands of fine spines and increasing slightly in width distally. Thread unarmed.
- (ii) Large stenoteles, found in capitula of tentacles. Capsule oval, $12,6\text{--}14,4 \times 10,8\text{--}12,0 \mu$. Details of armature not distinguishable.
- (iii) ?Small stenoteles, abundant in capitula of tentacles and also present on hydranth body. Capsule oval, $6,0\text{--}6,7 \times 5,0\text{--}5,7 \mu$. Not seen discharged.

Remarks

The nematocysts of this material agree with those described by Philbert & Weill, except that the two categories of stenoteles are smaller. Warren's 'large' and 'small' nematocysts appear to correspond to the large and small stenoteles respectively.

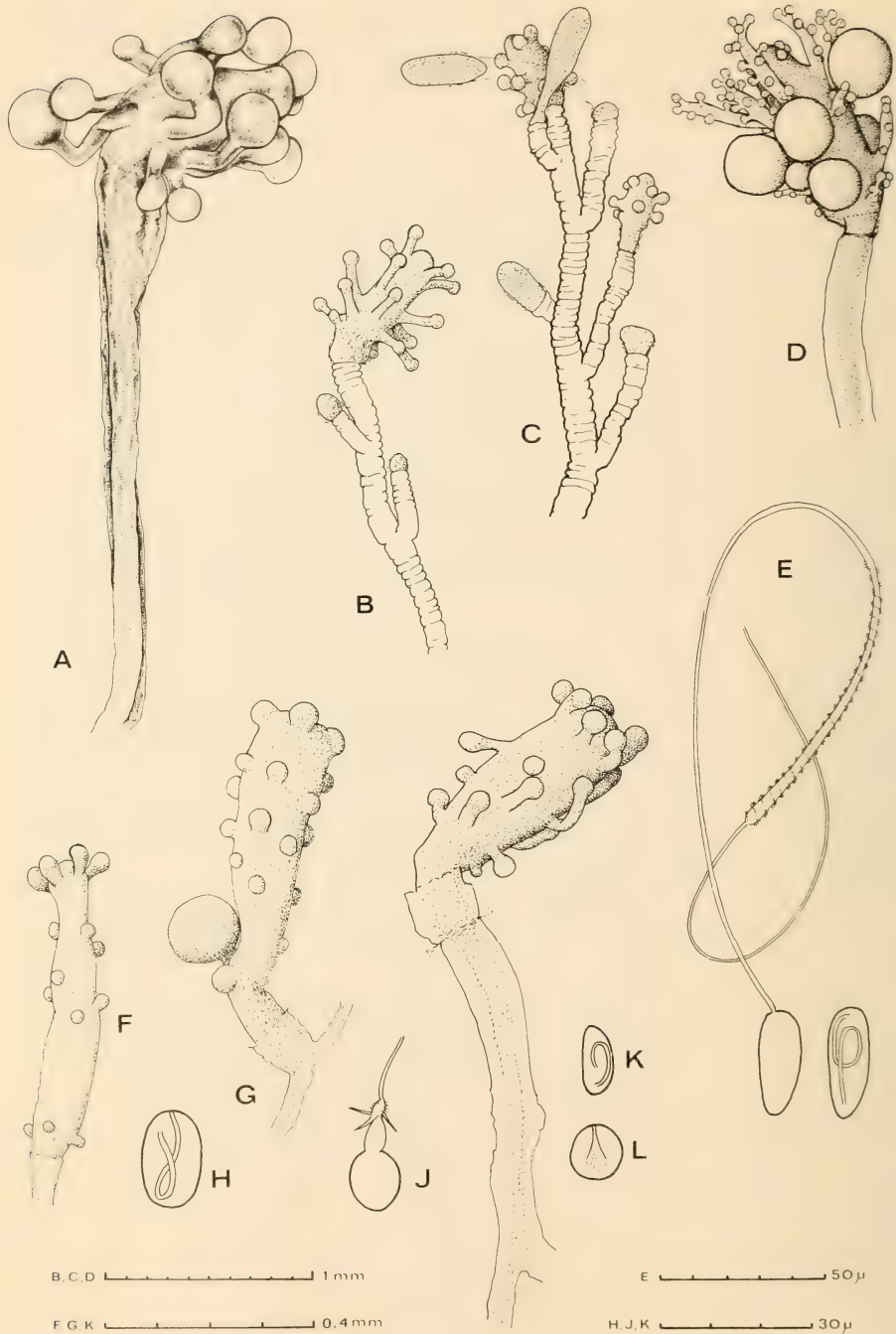


Fig. 1.

A. *Sphaerocoryne bedoti*. B-C. *Coryne ?pusilla*, C showing production of regeneration bodies. D-E. *Cladocoryne floccosa*. D, hydranth with male gonophores, and E, discharged and undischarged euryteles. F-L. *Zanclea* sp. F and G, hydranths from colony commensal with polyzoan; H and J, large bean-shaped nematocyst and large stenotele from the same colony; K, hydranth from colony commensal with coral; L, small bean-shaped nematocyst and large stenotele from the same colony.

Family *Corynidae**Coryne ?pusilla* Gärtner, 1774

Fig. 1 B, C

Coryne pusilla: Hincks, 1868: 39; pl. 7, fig. 1. Warren, 1908: 289, fig. 4.*Description*

Stems unbranched or with a few lateral branches, reaching about 4 mm in height. Stem closely annulated throughout or with the basal part only roughly corrugated; perisarc continued over the base of the hydranth as far as the first tentacles as a very thin transparent membrane, but not expanded in any way.

Hydranths 0,37–0,75 mm in length and about 0,2 mm in maximum diameter. Tentacles 11–19 in number, 3–5 forming a verticil round the mouth and the remainder irregularly scattered or with a tendency to form 3–4 alternating verticils.

Nematocysts: stenoteles of varying size, $8,4 \times 4,8$ – $15,0 \times 9,0$ μ .

Remarks

It is impossible to be certain about the identity of this material in the absence of gonophores. Warren has reported *C. pusilla* from Natal, and the annulation of the stem suggests this species. The dimensions and number of tentacles of the hydranth agree with Warren's 'dwarf form', which, however, was sterile and thus its identity subject to doubt. The continuation of the perisarc over the base of the hydranth resembles the condition illustrated by Prévot for *C. fucicola* (1959: fig. 7) but it is not swollen or expanded as is the case in *C. muscoides*.

Some of the specimens show vigorous asexual reproduction, the tips of lateral branches becoming separated off as regeneration bodies (Fig. 1 C). These bodies (frustules), when completely separate, are very similar to planula larvae, containing an outer layer of columnar ectoderm and an inner solid layer of endoderm. They measure 0,41–0,53 mm in length and 0,13–0,18 mm in diameter.

Sphaerocoryne bedoti Pictet, 1893

Fig. 1A

Sphaerocoryne bedoti Pictet, 1893: 10; pl. 1, figs 5, 6. Mammen, 1963: 48, figs 16–18.*Clavatella multitentaculata* Warren, 1908: 278; pl. 45, figs 7–9.*Sphaerocoryne multitentaculata*: Stechow, 1921: 248. Prévot, 1959: 108. Gravier, 1970: 149.*Description*

Pedicle (possibly incomplete) and hydranth together reaching a total height of 3,5 mm. Pedicle increasing in diameter distally, 0,11 mm wide at base, 0,16 mm

at distal end; perisarc smooth. Hydranth body 0,7 mm in length (preserved), with 15 capitate tentacles in two alternating verticils.

Remarks

This is probably a young hydranth.

Family **Zanclidae**

Zancla sp.

Fig. 1 F-L

Description

Four commensal zancleid colonies have been collected in the Inhaca area, all of which superficially appear to fall within the range of *Z. costata*, as discussed by Millard & Bouillon (1973). However, the first of these shows certain differences in host and cnidome from the other three, and will be described separately.

Colony 1: (Fig. 1 K, L)

Colony commensal with a coral. Hydrorhiza coated with firm perisarc and ramifying on the surface of the coral skeleton below the soft body. Hydrocaulus penetrating the coral body and emerging at the surface through a pore, enclosed in perisarc to just above level of emergence where it becomes membranous and creased.

Hydranths all infertile, reaching a maximum height of 1,1 mm, with 18-28 stalked capitate tentacles, of which six form an oral whorl and the rest are irregularly scattered.

No large bean-shaped nematocysts comparable with those of the Seychelles colonies could be found, but a very few small bean-shaped capsules measuring $13,8 \times 6,0 \mu$ were seen in the lower part of the body.

Large and small stenoteles, measuring $10,8 \times 9,0 \mu$ and $6,0 \times 4,8 \mu$ respectively, occur abundantly in the tentacles and the body.

Colonies 2, 3 and 4 (Fig. 1 F-J)

Colonies commensal with polyzoa. Hydrorhiza ramifying within the polyzoan and coated with thin perisarc which terminates at the level of emergence of the hydrocaulus or slightly above.

Hydranths reaching a maximum height of 0,8 mm, with 11-24 tentacles, of which 3-5 have larger capitulae than the rest and form an oral whorl, and the remainder are irregularly distributed over the body. Tentacles mostly with very short stalks and some reduced to mere knobs.

Medusa-buds borne on the lower part of the hydranth either amongst the lower tentacles or below them, 1-3 per hydranth. Largest medusa 0,16 mm in diameter and showing rudiments of marginal bulbs.

Nematocysts of three types:

- (i) Large, bean-shaped capsules, probably macrobasic euryteles, varying slightly in shape from $19,2 \times 10,8 \mu$ to $22,8 \times 7,8 \mu$. Butt forming at least one loop in the longitudinal axis. Present in body and hydrocaulus.
- (ii) Large stenoteles with almost spherical capsules, reaching $11,4 \times 10,8 \mu$, present in capitulae of tentacles and elsewhere in the body.
- (iii) Small stenoteles with almost spherical capsules, $6,0 \times 4,8 \mu$, abundant in tentacles and also present elsewhere in body.

These colonies show shortening of the tentacles which may be concomitant with the early reproductive stage. The appearance of the undischarged capsules of the large bean-shaped nematocysts is slightly different from those of the Seychelles material described by Millard & Bouillon (1973).

Family Clavidae

Rhizogeton nudum Broch, 1909

Fig. 2A

Rhizogeton nudum Broch, 1909: 137, fig. 1. Ritchie, 1910: 827, fig. 80. Mammen, 1963: 34, fig. 3. Rees & Thursfield, 1965: 48.

Description

Hydrorhiza reticular, coated with a transparent layer of perisarc. Hydranths sessile, cylindrical, 0,84–2,00 mm in height, with a very low collar of perisarc around the base, with 16–26 filiform tentacles scattered over the distal two-thirds of the body and increasing in length distally so that the most distal are about three times the length of the most proximal.

Gonophores male, borne directly on hydrorhiza, oval, completely enveloped in thin perisarc, reaching a maximum size of $0,29 \times 0,23$ mm.

Remarks

This species was originally described from the Arctic and has since been reported from the same area several times by Kramp (1932, 1943). Infertile material has been reported from the Pacific Ocean (Ritchie 1910) and from India (Mammen 1963). The presence of male gonophores similar to those of Broch in the present material seems to confirm the presence of the species in the Indian Ocean in spite of the peculiar discontinuity of the distribution.

Turritopsis nutricula McCrady, 1856

Turritopsis nutricula: Russell, 1953: 115, figs 54–56; pl. 5, figs 1–5; pl. 29, figs 1–3. Vervoort, 1968: 5. Millard & Bouillon, 1973: fig. 4C.

Description

Larger stems reaching 5 mm in height, branching irregularly, but unfascicled and presumably still young. Perisarc of stem in two layers, the inner firm and

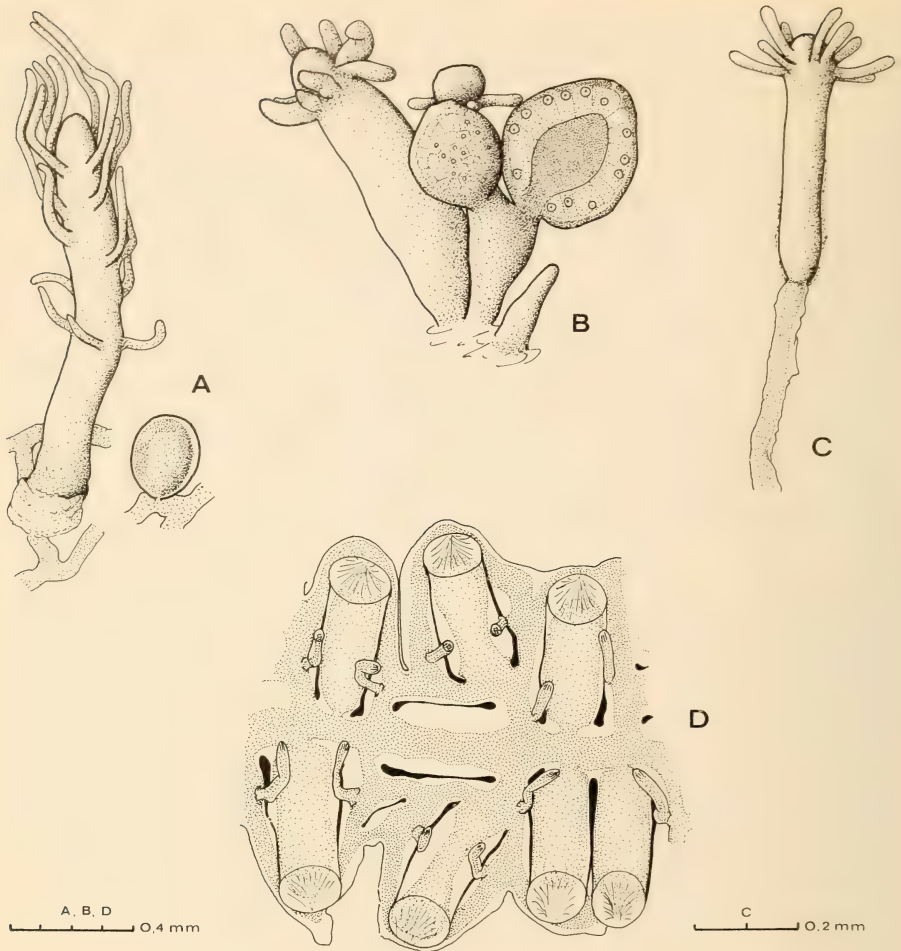


Fig. 2.

A. *Rhizogeton nudum*, hydranth and male gonophore. B. *Podocoryne ?carnea*, gastrozoid, gonozoid and spine. The right gonophore is shown in half section. C. *Incertae sedis* species 1. D. *Lineolaria* sp., surface view of colony with hydrothecae and nematothecae.

corrugated, the outer thin and sometimes with adhering silt. Branches adnate and parallel to stem for some distance, then diverging at an acute angle. Several young and unbranched stems present bearing a single terminal hydranth, only slightly more advanced than those illustrated by Russell (1953: pl. 5, fig. 5); the perisarc in these also in two layers.

Hydranth with 12–38 scattered filiform tentacles, the proximal ones shorter than the distal.

Young medusa-buds borne below hydranths on the taller stems, about 0,10 mm in diameter.

Family **Eudendriidae***Eudendrium capillare* Alder, 1856

Fig. 3 E–H

Eudendrium capillare Alder, 1856: 355; pl. 12, figs 9–12. Picard, 1955: 183. Mammen, 1963: 57, figs 25, 26.

Eudendrium parvum Warren, 1908: 272, fig. 1; pl. 45, figs 1–4.

Eudendrium ?parvum: Millard, 1959: 305, fig. 1 G–H.

Non Eudendrium ?capillare: Millard, 1966: 454.

Description

Stem unfascicled, unbranched or sparsely and irregularly branched, reaching 1,4 cm in height, annulated or corrugated on origins of branches, hydranth pedicels often annulated or corrugated throughout. Hydranth with 17–23 tentacles (mean number 19 in eight counts).

Male gonophores present in two colonies, one- to three-chambered, sometimes with a terminal tubercle, borne on completely atrophied hydranths— even in the youngest there is no sign of tentacles.

Female gonophores present in two colonies; young ones borne by partly atrophied hydranths in which tentacles are present but reduced in size, spadix unbranched; one old blastostyle present in which the tentacles are completely absent and the spadices of the gonophores shed. Eggs orange in colour, reaching 0,22 mm in diameter.

Only small nematocysts present, abundant on tentacles and also present in hydranth body: microbasic euryteles, $6,6 \times 2,4$ – $8,0 \times 3,0 \mu$, undischarged only.

Remarks

This is the first of three small species of *Eudendrium* which occur at Inhaca. They are all very similar in their growth-form and all have female gonophores with an unbranched spadix. As Picard (1951, 1955) has shown, the only sure way of distinguishing such species is by nematocyst structure. *E. capillare* differs from the other two in the complete absence of large nematocysts. It also differs in the absence of tentacles at all stages of development of the male blastostyles.

Eudendrium motzkossowskiae Picard, 1951

Fig. 3 J, K

Eudendrium simplex: Motzkossowska, 1905: 56; pl. 3, figs 18, 19.

Eudendrium motzkossowskiae Picard, 1951: 339.

Description

Stems unfascicled, unbranched or sparsely branched, reaching 1,2 cm in height, smooth for the most part but annulated on origins of branches and at other irregular intervals, hydranth pedicels sometimes annulated or corru-

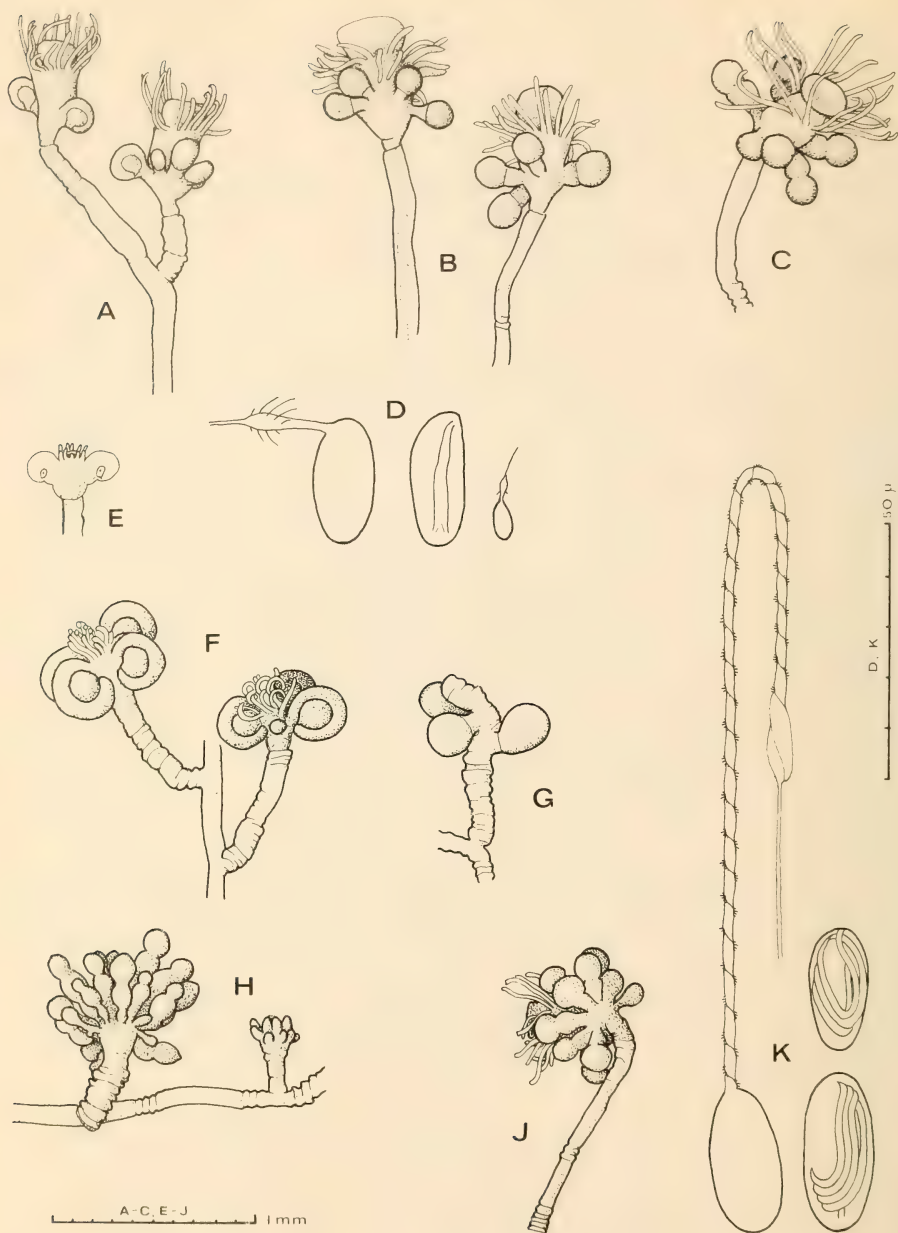


Fig. 3.

A-D. *Eudendrium ramosum*. A, young female blastostyles; B and C, male blastostyles; D, large microbasic eurytele discharged and undischarged and small microbasic eurytele discharged. E-H. *Eudendrium capillare*. E, very young female blastostyle; F, slightly older female blastostyles; G, old female blastostyle with spadix shed; H, old and young male blastostyles. J-K. *Eudendrium motzkossowskae*. J, male blastostyle; K, large macrobasic eurytele discharged and undischarged.

gated throughout. Hydranth with 16–27 tentacles (mean number 20 in 11 counts).

Male gonophores present in two colonies, one- and two-chambered, borne on non-atrophied hydranths. Female gonophores absent.

Nematocysts of two types:

- (i) Large macrobasic euryteles present on hypostome and lower part of hydranth body; sometimes rather scarce and present on only some hydranths of a colony, at other times abundant. Size rather variable, $15,6 \times 6,0$ – $31,6 \times 14,0$ μ . Undischarged capsule with butt in 3–4 obliquely longitudinal coils. Discharged capsule with butt 5–6 times length of capsule (150–165 μ), swollen distally to about double the width, bearing spirally arranged barbs which appear to be absent on most of the terminal dilation. Thread less than half width of proximal part of butt.
- (ii) Small microbasic euryteles present on tentacles and elsewhere, $6,6 \times 2,4$ – $7,2 \times 3,0$ μ , undischarged only.

Remarks

From the experience of the second author with Mediterranean hydroids, the size and structure of the large nematocysts in this material indicate an identity with *E. motzkossowskae*, so far known only from the Mediterranean. The discovery of the characteristic female gonophores with hermaphrodite contents is awaited to completely confirm the diagnosis.

Eudendrium ramosum (Linnaeus, 1758)

Fig. 3 A–D

Eudendrium ramosum: Allman, 1872: 332; pl. 13. Leloup, 1952: 127, fig. 64. Picard, 1955: 183. Millard, 1966: 456. Millard & Bouillon, 1973: 32, fig. 4F.

Description

Stem unfascicled, unbranched or sparingly branched with an alternate tendency; almost entirely smooth both on main stem and pedicels except for groups of a few annulations on origins of branches and at other rare intervals, reaching 2,0 cm in height. Hydranths with 18–29 tentacles (mean number 23 in 36 counts).

Male gonophores present in five colonies; one- or two-chambered, borne on non-atrophied hydranths. Female gonophores present in five colonies, borne on non-atrophied hydranths, with unbranched spadix.

Nematocysts of two types:

- (i) Large microbasic euryteles, present on hypostome and lower part of hydranth body, on spadix of female gonophore and on distal end of male gonophore, $22,5 \times 10,5$ – $28,8 \times 13,8$ μ . Undischarged capsule with butt about three-quarters length of capsule (0,67–0,84), increasing distally to about twice the diameter. Discharged capsule with butt

about three-quarters length of capsule and extruded at right angles to its main axis, dilated distally to about twice the diameter. Armature not clearly observed. Occasionally absent in some hydranths of a colony.

- (ii) Small microbasic euryteles, present on tentacles and elsewhere, $6,6 \times 2,4 - 8,4 \times 4,2 \mu$. Discharged capsule with butt about three-quarters length of capsule, dilated in distal half, armature not clearly observed.

Remarks

This is by far the most common of the three species of *Eudendrium*. It is surprising that all the colonies are so small and that none has a fascicled stem. However, larger colonies reaching 17,5 cm have been reported from the Cape, South Africa (Millard 1966).

Family Hydractiniidae

Hydractinia diogenes Millard, 1959

Hydractinia diogenes Millard, 1959: 305, fig. 2.

Description

Colonies very similar to holotype. Spines rather scarce, reaching 0,5 mm in length. Gastrozooids reaching 2,9 mm in height and with 10–16 tentacles. Gonozooids reaching 1,2 mm in height and with up to nine tentacles. Gonophores, all female, of various sizes, the largest 0,45 mm in depth and 0,47 mm in diameter.

Spiral zooids present on edge of one colony, reaching a length of 2,6 mm and bearing a terminal battery of nematocysts.

Podocoryne ?carnea M. Sars, 1846

Fig. 2B

Hydractinia carnea: Millard, 1957: 181.

Podocoryne carnea: Edwards, 1972: 122, 136, figs 7–9.

Description

Hydrorhiza forming an open meshwork in younger parts and an incrustation of coalesced tubes in the older parts. Spines hollow, transparent or horn-coloured, straight or curved, about 0,3 mm in height. No spiral zooids or tentaculozooids.

Gastrozooids reaching 1,14 mm in height (preserved), with 7–10 tentacles, usually long and short alternating. No perisarcal cup round base.

Gonozooids more slender than gastrozooids and often much smaller,

reaching 1,14 mm in height (preserved), with 4–7 tentacles, bearing 1–3 gonophores on lower half.

Gonophores packed with about 60 eggs in seven or eight tiers, the largest gonophore $0,57 \times 0,49$ mm, with four radial canals and a circular canal, and in some, rudiments of four marginal bulbs or tentacles.

Remarks

These gonophores are very similar to those with precociously developed sexual products in material ascribed to *P. carnea* by Millard & Bouillon (1973), and by Millard (1957). They differ in the larger number of smaller eggs.

Several other infertile hydractiniids on various substrata, including barnacles, worm-tubes, empty gastropod shells and a *Pecten* shell, may possibly be the same species. Some possess spines and others are without. Some possess spiral zooids scattered amongst the hydranths.

INCERTAE SEDIS

Species 1

Fig. 2C

Description

Hydrocaulus unbranched, perisarc firm and roughly corrugated in lower part but increasing in diameter and becoming very thin distally to continue over the body of the hydranth as a membranous layer, terminating below the tentacles.

Hydranth minute, cylindrical, fairly clearly demarcated from hydrocaulus, with conical hypostome and a single whorl of 7–9 filiform tentacles held alternately elevated and depressed, no web between the tentacles. Hydranth 0,17–0,48 mm in length. Total height (hydranth plus hydrocaulus): 0,62–1,16 mm.

Remarks

These specimens show some resemblance to hydranths of the family Pandeidae, and especially to the genus *Amphinema*. They resemble *A. rugosum* in the corrugated perisarc and *A. dinema* in the membranous terminal part of the perisarc. It is not possible to be more definite in the absence of gonophores.

Species 2

Description

A stolonial colony with reticular hydrorhiza creeping among sand grains and giving rise to solitary hydranths. Hydrorhiza and hydrocaulus enclosed in perisarc. Hydranth emerging from side of hydrocaulus, with 10–13 filiform tentacles, reaching a maximum height of 0,64 mm when extended. Hydrocaulus reaching a height of 2,55 mm.

Remarks

This is the same species described by Millard & Bouillon (1973: fig. 4H). The hydrocaulus is taller in this material, but shows no indication of branching. The systematic position remains uncertain.

Species 3

Lineolaria sp.

Fig. 2D

Lineolaria sp. Gravier, 1970: 144, figs 11, 13A. Gravier, 1972: 8.

Description

Colony growing on *Cymodocea*. Hydrorhiza generally running parallel to the long axis of the frond, in single, double or triple strands connected to one another by cross anastomoses; each longitudinal strand giving rise to a row of hydrothecae on each side which may be alternate, opposite or irregular.

Hydrotheca tubular, adherent to weed for most of its length, then bent upwards. Perisarc thickened near base, becoming thin distally. Margin facing obliquely upwards, circular, untoothed, with an operculum of many delicate converging segments. Hydranth with about 14 tentacles and a conical hypostome.

Nematothecae borne on hydrorhiza on the transverse connections, one or two flanking each hydrotheca and leaning over it, erect, not adherent, tubular, containing a group of large nematocysts.

Gonothecae absent.

Measurements (mm)

Hydrotheca, length	..	..	..	..	..	0,42-0,57
diameter at margin	..	..	..	..	..	0,16-0,21
Nematotheca, length	..	..	..	..	..	0,15-0,22
maximum diameter	..	..	..	..	..	0,04-0,05

Remarks

This appears to be the same species as that briefly described and illustrated by Gravier from Madagascar. We have refrained from naming the species or placing it in a family pending a forthcoming publication by Gravier.

Family **Haleciidae***Halecium tenellum* Hincks, 1861

Halecium tenellum: Vervoort, 1959: 229, fig. 8. Millard, 1966: 471, fig. 11 C-F.

Description

This small species occurs abundantly on any available substratum. Some of the stems are beautifully regular and geniculate, with a hydrotheca arising from

each internode. Others are less regular, with numbers of intervening athecate internodes, particularly in the basal region. Branches arise singly or in pairs from the distal ends of the internodes. Rejuvenation is common and many tiers of secondary hydrothecae occur.

Male and female gonothecae occur on separate colonies and arise either from the hydrorhiza or from the upright stem. They are similar to those previously described (Millard 1966).

Hydrodendron gardineri (Jarvis, 1922)

Fig. 4

Halecium gardineri Jarvis, 1922: 334; pl. 24, fig. 1.

Description

Hydrorhiza reticular and strengthened by internal thickenings of perisarc, giving rise to solitary hydrophores and erect stems. Stem reaching a maximum height of 4 mm, unfascicled, unbranched, divided into internodes by oblique nodes sloping in alternate directions. Each internode bearing a single hydrophore on a short apophysis arising near the centre or at about two-thirds of the length. Hydrophores alternate, the two rows in one plane.

Hydrophore (Fig. 4B) consisting of a pedicel separated from the apophysis by a twisted node, bulging slightly at base, then expanding smoothly to merge into the cup-shaped hydrotheca; completely symmetrical or with an oblique margin. Hydrotheca deep, with oblique diaphragm sloping downwards on adcauline side; margin not, or slightly, everted; marginal diameter approximately equal to depth on adcauline side. Many hydrophores regenerated, resulting in supplementary internodes, which are often roughly corrugated, between the apophysis and the pedicel (Fig. 4A). Solitary hydrophores usually with a number of supplementary internodes at base (Fig. 4C and D). No refringent nodules in hydrotheca.

Nematothecae borne irregularly on hydrorhiza, on stem and on regeneration nodes, but none seen on unregenerated pedicels, goblet-shaped, with everted margin. Nematophore with a solid core of endoderm cells and a terminal capitulum.

Hydranth with 18 tentacles in the only expanded example, and no intertentacular web, large but apparently just able to be contained in the hydrotheca.

Nematocysts of at least two types (Fig. 4G):

- (i) Small microbasic mastigophores, abundant on tentacles. Capsule $5,4 \times 1,8 \mu$ (discharged). Butt $4,8 \mu$ in length, with about six spiral bands of short spines.
- (ii) Large heteronemes, seen on nematophores only, $18,0 \times 6,6 \mu$ (undischarged).

Gonophores absent.

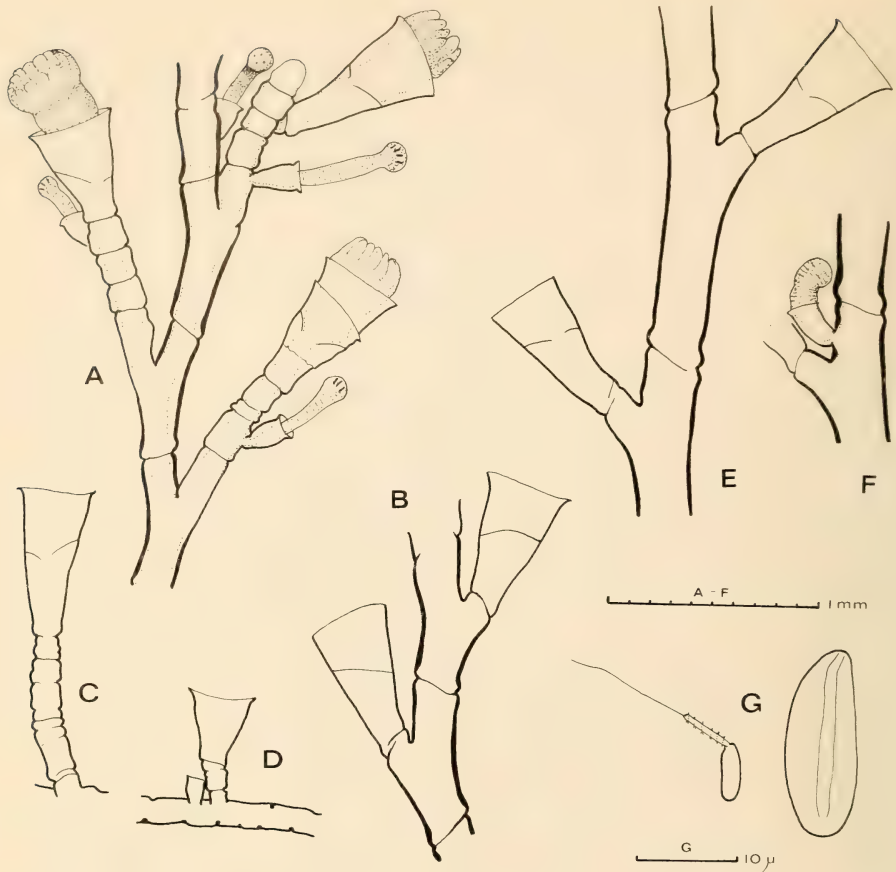


Fig. 4. *Hydrodendron gardineri*.

A-B. Parts of erect stem showing hydrophores and nematophores. C-D. Solitary hydrophores, D with a nematotheca. E-F. Parts of an erect stem from Jarvis's schizotype. G. Macrobasal mastigophore and large heteroneme.

Measurements (mm)

Stem, internode length	..	..	..	0,18-0,34
diameter across node	..	..	..	0,06-0,09
Hydrophore, length adcauline, unregenerated	..	..	..	0,20-0,23
Hydrotheca, depth adcauline	..	..	..	0,11-0,16
diameter at margin	..	..	..	0,13-0,17
Nematotheca, depth	..	..	..	0,08-0,10
diameter at margin	..	..	..	0,05-0,07

Jarvis's type

0,30-0,50
0,08-0,10
0,24-0,30
0,11-0,14
0,14-0,17
0,08-0,09
0,05

Remarks

Through the courtesy of the British Museum (Natural History) we were able to examine a prepared slide of Jarvis's type material of *Halecium gardineri*

(Fig. 4 E and F: schizotype, no. 23.2.15.9) from Chagos and there is no doubt about the identity of the Inhaca material. Measurements from the type are included above as none were given by Jarvis and her quoted magnification is not accurate.

Hydrodendron sympodiformis n. sp.

Fig. 5

Holotype: a very rich fertile colony on weed from Inhaca, Ponta Torres.

Description

Hydrorhiza creeping, branching and reticular, with internal thickenings of perisarc in some areas only.

Hydrophores arising from hydrorhiza, either unbranched and solitary or branching in a very obviously sympodial manner to reach a maximum height of 7 mm. Solitary hydrophores pedicellate, with pedicel of variable length widening distally to merge into hydrotheca. Shorter pedicels completely smooth, longer ones (possibly regenerated) with one or two nodes or corrugations near base. In branching stems each hydrophore giving off a lateral apophysis near distal end which bears the next hydrophore, this process being repeated up to nine times, the base of each hydrophore being curved upwards so that it stands almost parallel to the preceding one; the series of apophyses not in one plane but arising from any surface. Two apophyses sometimes arising at the same level, so producing a dichotomous appearance.

Hydrotheca widening to margin, which may or may not be everted, with diameter usually a little over twice the depth, with a straight diaphragm and a circle of refringent nodules between margin and diaphragm. Hydranth with about 22 tentacles.

Nematothecae borne in random fashion on hydrorhiza and hydrophore pedicels, vase-shaped, with an everted margin and a perisarc thickening just below it. Nematophore with a solid core of endoderm cells and a terminal capitulum containing a battery of large nematocysts about $22,5 \times 10 \mu$.

Gonothecae borne in abundance on hydrorhiza, all female, barrel-shaped but with widest part below centre, with 6-7 very distinct transverse annulations and a terminal aperture on a narrowed neck, containing one planula larva.

Measurements (mm)

Hydrotheca, depth, margin to diaphragm	..	..	0,06-0,10
diameter at margin	..	..	0,17-0,22
Nematotheca, depth	..	..	0,14-0,20
diameter at margin	..	..	0,09-0,11
Gonotheca, depth	..	..	0,63-0,80
maximum diameter	..	..	0,39-0,44
diameter at margin	..	..	0,20-0,26

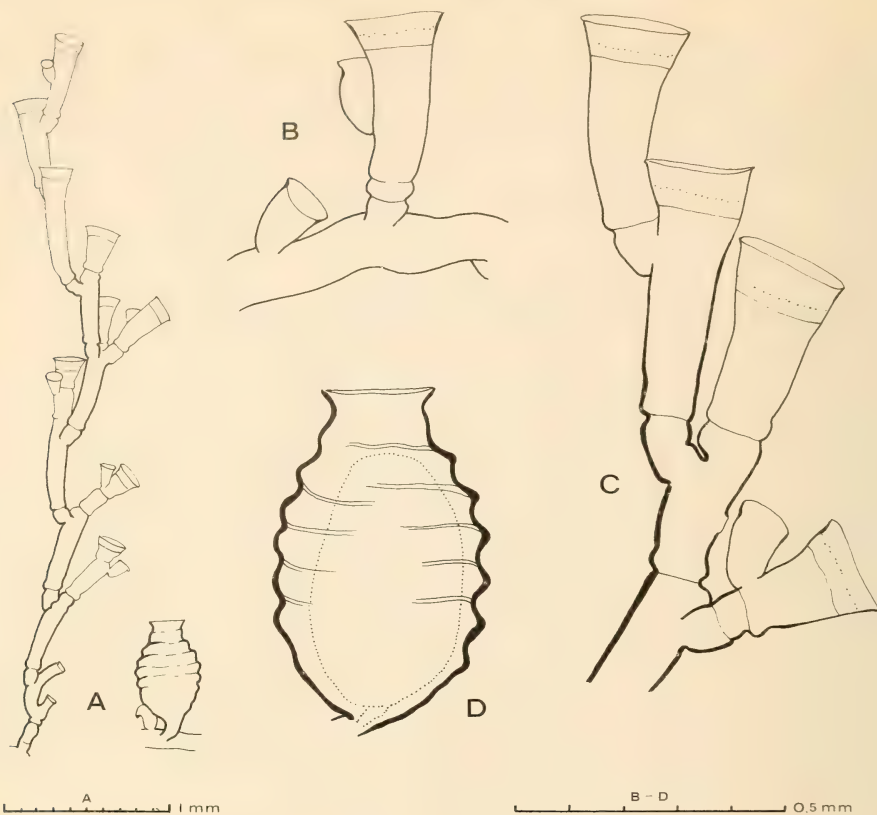


Fig. 5. *Hydrodendron sympodiiformis* n. sp.

A. Complete stem and gonotheca. B. Solitary hydrophore and nematothecae. C. Part of stem. D. Gonotheca.

Remarks

The growth-form of this material shows similarities to that of *H. negligens* (Fraser 1938) and *H. alternata* (Fraser 1938) from the Pacific, but certain differences from the structure of the trophosome of both and from the shape of the gonotheca in the latter seem to merit the establishment of a new species.

Family Campanulariidae

Campanularia delicata (Trebilcock, 1928)

Orthopyxis delicata Trebilcock, 1928: 3; pl. 2, fig. 1. Ralph, 1957: 837, 840, fig. 7 a-d.

Campanularia delicata: Millard & Bouillon, 1973, fig. 6 G-M.

Remarks

The hydrothecae and gonothecae (male) of this material are similar to those described by Millard & Bouillon (1973), from the Seychelles and show similar variations. The hydrothecal pedicels in particular show much variation in length and amount of annulation.

Clytia sp.

Fig. 6A

Description

Colony stolonial. Pedicel closely annulated at base and distal end. Hydrotheca deep and slender, with height $2\frac{1}{4}$ – $3\frac{1}{2}$ times diameter, margin with 5–8 triangular, slightly asymmetrical teeth. Diaphragm well developed.

Measurements (mm)

Pedicel, height	0,44–1,12
Hydrotheca, depth	0,48–0,59
diameter at margin	0,14–0,24

Remarks

The hydrothecae have the same proportions as *C. warreni* Stechow, 1919, from South Africa, *C. elongata* Marktanner-Turneretscher, 1890, from New Zealand, and *C. ulva* Stechow, 1919, from Marseille. They differ from *C. elongata* in the deeper marginal teeth. The actual size is intermediate between that of *C. ulvae* and *C. warreni*. The marginal teeth are fewer in number than any of the three species mentioned.

In the absence of gonothecae and because of the small size of the sample it is not possible to diagnose the material with any certainty. It might possibly be an extreme variation of *C. hemisphaerica*.

Family **Lafocidae***Scandia mutabilis* (Ritchie, 1907)*Description*

Hydrothecal pedicels very variable in length, 0,3–4,2 mm, but always annulated. Hydrothecae also variable in size, 1,6–3,9 mm in height, generally quite smooth, but a few with very faint transverse corrugations.

Family **Sertulariidae***Abietinaria laevimarginata* (Ritchie, 1907)

Fig. 7 A–C, E–H

Sertularia laevimarginata Ritchie, 1907: 507; pl. 26, figs 5, 6.

Sertularia linealis Warren, 1908: 308, fig. 9. Millard, 1958: 195, fig. 8 D, G.

Abietinaria laevimarginata: Stechow, 1921: 258. Gravier, 1972: 8, fig. 2C.

Non Sertularia linealis var. *longa* Millard, 1958: 197, fig. 8E. Millard & Bouillon, 1973, fig. 9 E, F.

Non Sertularia linealis: Millard, 1968: 272.

Description

Hydrorhiza creeping on weed and typically forming longitudinal lines with cross-connections; with no regular internal pegs of perisarc, but usually

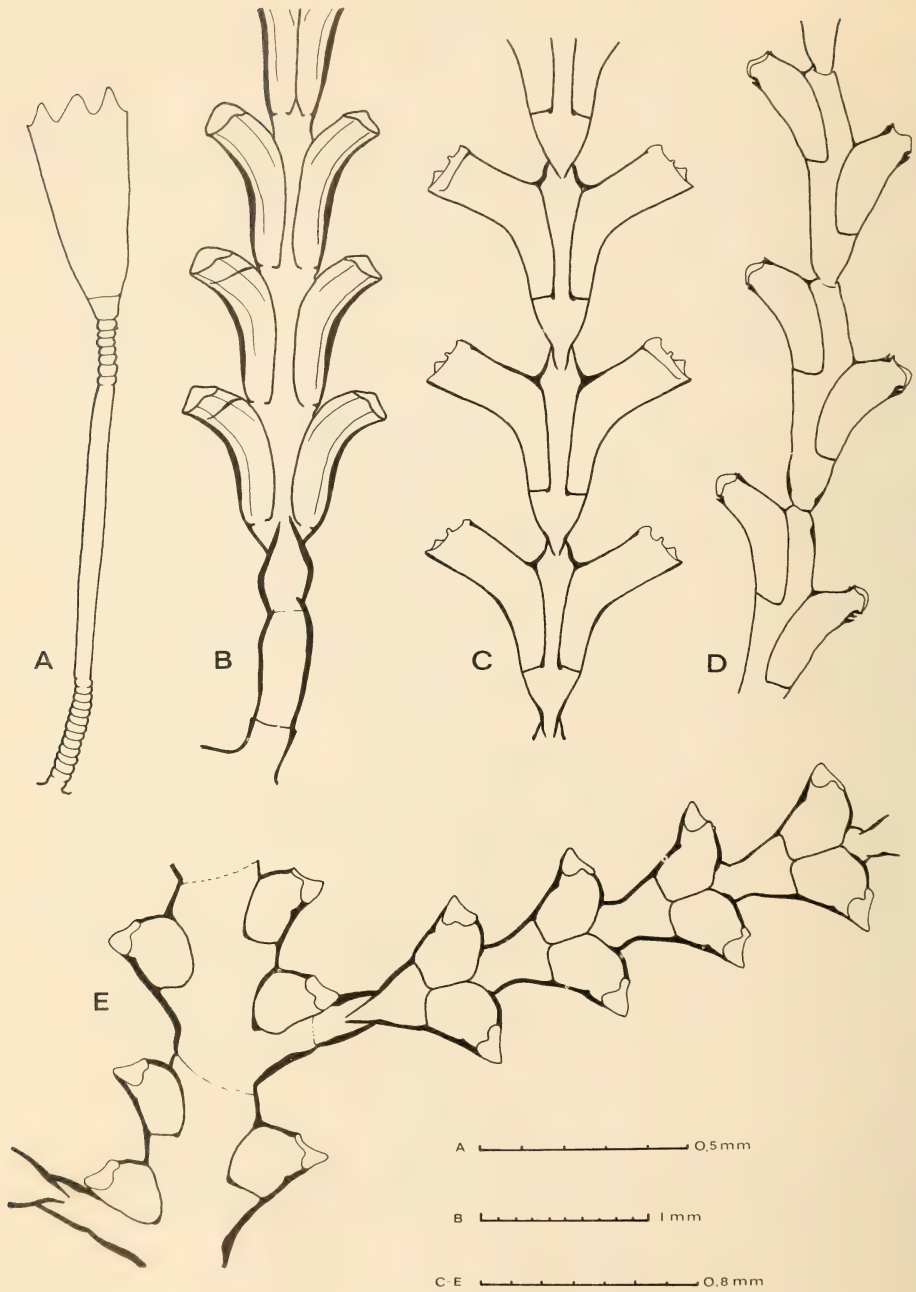


Fig. 6.

A. *Clytia* sp. B. *Diphasia digitalis*, unbranched stem. C. *Diphasia tetraglochina*, unbranched stem. D. *Dynamena crisioides*, var. *alternata*, hydrocladium. E. *Sertularia marginata*, part of stem and hydrocladium.

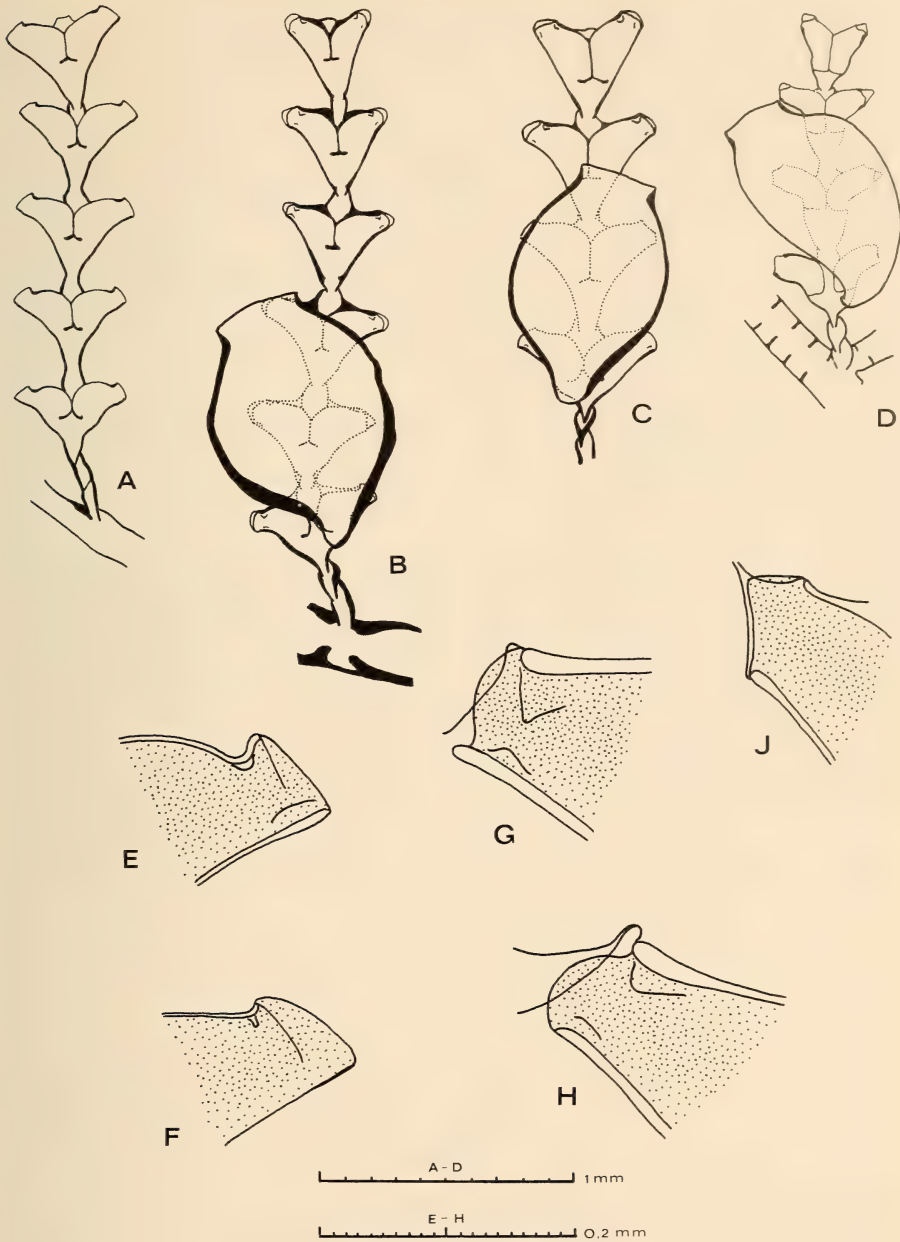


Fig. 7.

A, E-F. *Sertularia laevimarginata* Ritchie, holotype (E and F from different stems). B, G. *Sertularia linealis* Warren, holotype. C, H. *Abietinaria laevimarginata*, from Inhaca. D, J. *Sertularia longa*, from Inhaca. (In E-J the distal part of the hydrotheca is drawn without the near wall to show details of internal teeth and operculum.)

with a group of four ingrowing perisarc lobes around the origin of each stem.

Stem reaching a maximum height of 3,5 mm and bearing a pair of opposite hydrothecae on each internode. Two hinge-joints at the base of each stem, remaining nodes slightly oblique or indistinct.

Hydrotheca bent outwards, narrowing to margin and usually constricted just below it, with thickened perisarc, especially near the adcauline edge. The free adcauline parts of a pair of hydrothecae forming a straight line at right angles to the axis of the stem, except occasionally in the distal pair which are more erect and may subtend an obtuse angle between them. Margin with two low, rounded lateral lobes, which vary considerably in development—they may be quite distinct or almost obsolete. Operculum of one adcauline valve, shed easily. Internal teeth present, including one large adcauline tooth (occasionally double) and two low latero-abcauline teeth.

Gonotheca borne on front of stem below first pair of hydrothecae, smooth, compressed, spherical to ovoid in broad view, with a wide distal aperture on a low collar.

Remarks

Gravier (1972) has synonymized Warren's *Sertularia linealis* with *Abietinaria laevimarginata*. In order to confirm this course of action, and to clarify Warren's statement that *S. linealis* has a 'two-flapped operculum', the first author has examined type material of Warren's *S. linealis* borrowed from the Natal Museum, Pietermaritzburg (No. 747) and from the British Museum of Natural History (Nos. 22.3.6.26, 27 and 33, Fig. 7 B, G). In both these collections whole mounts clearly show a single adcauline opercular valve. But also included in the British Museum material is a slide of sections (No. 22.3.6.32) of a completely different species, with a hydrotheca of a different shape and a two-valved operculum (labelled *S. linealis* but probably *S. distans*). This confusion might thus account for Warren's erroneous statement.

The schizoholotype of *S. laevimarginata* Ritchie (B.M. No. 1964.8.7.148) consists of two infertile stems (Fig. 7 A, E, F). The perisarc throughout is somewhat thinner than in *S. linealis*, and internal thecal teeth are generally absent, though in one hydrotheca three internal teeth are visible, one adcauline and two low latero-abcauline. Around the origin of each stem is one ingrowing lobe of perisarc, not four as in *S. linealis*; however, even in the latter species these lobes are not always conspicuous. The details of shape and dimensions of the hydrothecae are sufficiently like those of *S. linealis* to confirm the synonymy in spite of the minor differences.

With the abundant new material it has now become clear that the first author has previously confused two species under the name of *S. linealis*, due partly to the fact that both have a similar growth-form on weed and may grow together, and to the fact that the hydrothecae of *A. laevimarginata* easily lose the opercula. The second form, described by Millard (1958) as *Sertularia linealis* var. *longa* is now elevated to specific rank (see p. 33 and Fig. 7 D, J). The two

species can be distinguished not only by the form of the operculum, but by differences in the hydrorhiza, presence or absence of internal teeth, and the shape of the gonotheca.

Diphasia digitalis (Busk, 1852)

Fig 6B

Desmoscyphus longitheca Allman, 1877: 26; pl. 14, figs 3-6.

Nigellastrum digitale: Mammen, 1965: 57, fig. 89.

Diphasia digitalis: Vervoort, 1968: 37, fig. 17. Millard & Bouillon, 1973, fig. 9A.

Description

Stems either unbranched, or with alternate branches arising after every two or three pairs of hydrothecae. Branches forming almost a right angle with stem. Hydrothecae in opposite pairs; members of a pair well-separated near the base of the stem, but shifted on to the front and contiguous with one another in the distal parts and on the branches; consecutive pairs close, separated by a distance not more than $\frac{1}{8}$ of their height, but more often in contact or overlapping.

Hydrotheca tubular and curved outwards, usually with three or five longitudinal ridges, in the latter case two anterior, two posterior and one lateral.

Gonothecae absent.

Remarks

The branching of this material is very similar to that figured by Allman (1877) (as *Desmoscyphus longitheca*). In some stems the branches are similarly short, in others they are longer.

The hydrothecae are similar to those described from the Seychelles (Millard & Bouillon 1973), but the longitudinal ridges are more distinct.

Diphasia tetraglochina Billard, 1907

Fig. 6C

Diphasia tetraglochina Billard, 1907: 358, fig. 7. Millard, 1964: 28, fig. 8.

Description

Two of these colonies are exactly similar to the material from the Agulhas Bank, South Africa (Millard 1964), i.e. the hydrothecae are shorter and wider but with a greater proportion adnate ($\frac{2}{3}$ - $\frac{3}{4}$) than those of the type material (Billard 1907).

The third colony, from Cabo da Inhaca (Fig. 6C), is more like Billard's material with taller and more slender hydrothecae with a smaller proportion adnate ($\frac{1}{2}$ - $\frac{2}{3}$).

Measurements of material from Cabo da Inhaca, in mm.

Internode length	0,52-0,63
Hydrotheca, length abcauline	0,40-0,51
length adcauline, adnate part	0,31-0,39
length adcauline, free part	0,18-0,26
adnate part/adcauline length	0,57-0,64
diameter at margin	0,15-0,20

Dynamena crisioides Lamouroux, 1824

Fig. 6 D

Dynamena crisioides: Billard, 1925: 181, figs 36, 37 C-E; pl. 7, fig. 21. Millard, 1958: 183. Mammen, 1965: 51, figs 84, 85.

Dynamena crisioides, var. *peculiaris* Billard, 1925: 185, fig. 38.

Dynamena crisioides, var. *gigantea* Billard, 1925: 186, fig. 37F; pl. 8, fig. 24. Millard, 1958: 183, fig. 6C.

Dynamena crisioides, var. *alternata* Billard, 1925: 187, figs 37G, 39; pl. 7, fig. 22.

Description and remarks

This species is abundant in the collection and shows great variation. The normal variety and Billard's var. *gigantea* both occur and sometimes in the same colony. Possibly the latter is an older stage of the former.

One sample of Billard's var. *alternata* is also present (Fig. 6D), which shows the characters described by Billard, namely two alternate hydrotheca on most of the hydrocladial internodes, hydrothecae less adnate than in the typical form, and hydrocladial apophyses arising below the third hydrotheca of a stem internode instead of below the first as in the typical form. The hydrothecae are smaller than those of the typical form, measuring 0,25-0,33 mm in abcauline length as against 0,34-0,51 mm.

Internal teeth may occur in hydrothecae of any of the three forms, as in Billard's var. *peculiaris*.

Without doubt Mammen is right in his contention that it is not possible to retain separate varieties in this very variable species.

Sertularella

In addition to the single species listed on p. 8, several small specimens of *Sertularella* are present in the collection, but all are infertile and all appear to be juvenile colonies. Since it is not possible to be certain of the form of the adult colony in any of them, no attempt has been made at identification. There appear to be about three species involved.

Sertularia longa (Millard, 1958)

Fig. 7 D and J

Sertularia linealis, var. *longa* Millard, 1958: 197, fig. 8E.*Sertularia linealis*: Millard, 1968: 272.*Sertularia linealis longa*: Millard & Bouillon, 1973, fig. 9 E, F.*Description*

Hydrorhiza creeping on weed and usually forming longitudinal lines with cross-connections; with numerous strengthening internal pegs of perisarc growing in from the sides.

Stem reaching about 3 mm in height and bearing a pair of opposite hydrothecae on each normal internode. An oblique hinge-joint (or rarely two) at the base of each stem and hinge-joints occurring sporadically in the rest of the stem where each one forms the distal termination of a short intermediate athecate internode. Normal nodes slightly oblique.

Hydrotheca bent outwards, and abcauline wall with a definite kink in the lower or middle part, narrowing to margin, with comparatively thin perisarc but thickened around margin. The free adcauline parts of a pair of hydrothecae not forming a straight line, but subtending an obtuse angle between them which becomes smaller near the distal end of the stem where the hydrothecae are more erect. Margin with two well-developed and roundly triangular lateral teeth and sometimes a very low median adcauline one. Operculum of two valves hinged at the adcauline and abcauline edges, the adcauline smaller than the abcauline and divided into two by a median line. No internal teeth.

Remarks

This species has hitherto been confused with *Abietinaria laevimarginata*. See remarks on this species.

Sertularia marginata (Kirchenpauer, 1864)

Fig. 6E

Sertularia marginata: Millard, 1957: 224, fig. 13. Ralph, 1961: 785, fig. 12 a-g. Van Gernerden-Hoogeveen, 1965: 39, figs 13-17. Mammen, 1965: 45, fig. 77.*Sertularia inflata*: Vervoort, 1959: 281, figs 39-41. Van Gernerden-Hoogeveen, 1965: 45, figs 18-22.*Description*

Pinnate stems, on the whole with very regular segmentation, with few internodes which do not bear the normal hydrocladium and three hydrothecae. Basal athecate part of stem variable in length, 0.7-3.0 mm, terminated by a hinge-joint and containing a variable number of transverse nodes. Between hinge-joint and first hydrocladium 0-2 hydrothecae. Stem geniculate in distal region only. The two rows of hydrocladia in one plane.

Hydrocladium unbranched, separated from basal apophysis by hinge-joint and thereafter divided by very indistinct nodes into thecate internodes. Pairs of hydrothecae more closely set than in the South African material from False Bay (Millard 1957), the interval between consecutive pairs being usually less than, and never more than, the height of the hydrothecae. Hydrothecae also smaller and with less pronounced marginal teeth, 0,15–0,22 mm in abcauline height and 0,09–0,12 mm in marginal diameter.

Remarks

Among recent authors opinions differ as to whether or not *S. marginata* and *S. inflata* should be retained as separate species. Van Gernerden-Hoogveen claims to be able to distinguish between the two in Caribbean material, but the present material, and also that of Mammen (1965) and Ralph (1961), seems to combine features of both. The present authors follow the opinion first expressed by Billard (1925: 178) that *Sertularia marginata*, *S. flosculus*, *S. amplexens*, *S. gracilis*, *S. inflatus* and *S. versluysi* are all synonymous.

Family Plumulariidae

Plumularia obliqua (Johnston, 1847)

Fig. 8 A–D

Plumularia obliqua: Bale, 1884: 138; pl. 12, figs 1–3. Hincks, 1868: 304, fig. 36; pl. 67, fig. 1. Pennycook, 1959: 180.

?*Monotheca posidoniae* Picard, 1951: 341, fig. 2B.

Description

Details of structure conforming well with previous descriptions. Thickness of perisarc variable, young hydrocladia with no internodal septa behind hydrotheca, old ones with two strong septa.

Hydrotheca with an abcauline wall which is gently curved throughout or straight in the distal half.

Lateral nematothecae with the upper (abcauline) surface strongly cut away, as described by Bale.

Measurements (mm)

Stem, internode length	..	..	..	..	..	0,26–0,44
Hydrocladium, thecate internode, length	..	..	..	..	..	0,17–0,23
Hydrotheca, abcauline height	..	..	..	..	..	0,17–0,21
diameter at margin	..	..	..	..	..	0,14–0,16

Remarks

Picard (1951) has described a new species from the Mediterranean, *P. posidoniae*, which is said to differ from *P. obliqua* in the deeper hydrotheca, more convex abcauline wall and better developed perisarc. He includes Bale's

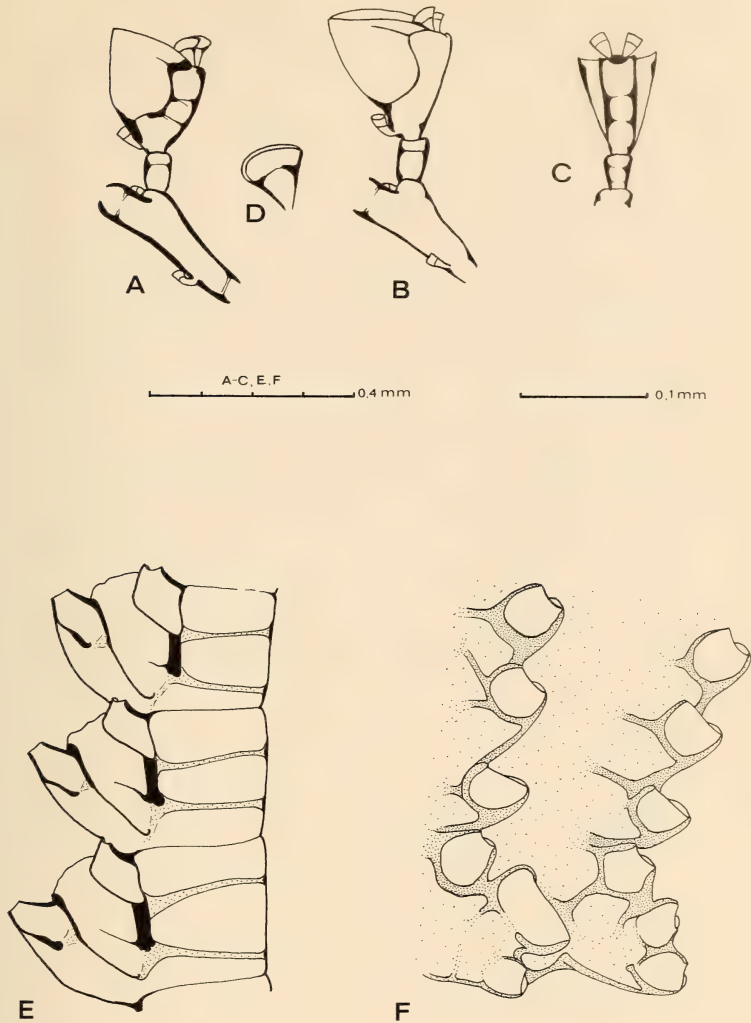


Fig. 8.

A-D. *Plumularia obliqua*. A and B, hydrocladia in side view, A with well-marked internodal septa, B without; C, hydrocladium in posterior view; D, lateral nematotheca. All from the same colony. E-F. *Aglaophenia cupressina*. E, part of a hydrocladium; F, the proximal part of two corbula ribs from the side.

material from Australia in this species. The present material shows sufficient variation to cover both and it is felt that there is little justification for a separate species. Picard gives no measurements and does not describe the structure of the lateral nematothecae.

This is the first record of the species from the East African coast.

Aglaophenia cupressina Lamouroux, 1816

Fig. 8 E, F

Aglaophenia cupressina Lamouroux, 1816: 169. Billard, 1913: 107, fig. 96; pl. 6. Bale, 1915: 319; pl. 47, figs 6-8.

Aglaophenia macgillivrayi: Allman, 1883: 34; pl. 10; pl. 20, figs 4-6.

Description

Several robust colonies of this beautiful species. Main stem branching and rebranching irregularly up to the fourth order. Final branches (pinnae) arising at regular intervals in subopposite pairs, bearing alternate hydrocladia. Hydrocladia also present on more distal parts of stem and larger branches.

Details of hydrocladia, hydrothecae and nematothecae as in previous descriptions. The slight longitudinal ridge down the centre of the lateral surface of the hydrotheca mentioned by Bale visible in macerated specimens only. Hydrotheca 0,25-0,28 mm in depth and 0,14-0,15 mm in marginal diameter. Margin smooth or sinuated, often with two or three pairs of low rounded lobes.

Corbulae abundant, replacing hydrocladia, with a pedicel of one thecate segment and about six pairs of ribs, completely closed, reaching 2,8 mm in length and 1,1 mm in diameter. The first two or three nematothecae of the rib seated on a raised lobe. Some corbulae with a free branch to the first rib of one side.

Remarks

This well-known Indo-Pacific species has been reported from Zanzibar on the East African coast by Kirchenpauer (1872, as *A. spicata*) and by Jarvis (1922). This is the most southerly record for the African coast.

Gymnangium gracilicaule lignosum (Millard, 1968)

Halicornaria gracilicaulis lignosa Millard, 1968: 283.

Remarks

These stems are not so woody or thick as is typical of this subspecies and most have only two orders of branching, one alone having three orders. They are probably young colonies.

The hydrotheca, however, is of the typical shape, i.e. short (about 0,23 mm in total height), with a pronounced sigmoidal curvature to the abcauline wall and a short distance (about 0,07 mm) between the abcauline margin and the point of separation of the median inferior nematotheca from the hydrotheca. The median inferior nematotheca is short and does not reach the level of the thecal margin.

Family **Proboscidactylidae***Proboscidactyla* (*Lar*) sp.

Fig. 9

Description

Colonies growing on tubes of the polychaet, *Laonome* sp. Hydrorhiza reticular, spreading between the sand-grains of the polychaet tube. Gastrozooids forming a single row on rim of tube, reaching a maximum height (preserved) of 0,48 mm to tip of hypostome. Two solid filiform tentacles arising at half to two-thirds of height and facing cavity of polychaet tube. Hypostome with an asymmetrically placed pad of nematocysts on the side away from the cavity.

Gonozooids of varying size, the largest ones reaching 0,31 mm in height and seated immediately below the gastrozooids or arising from their bases, only these large gonozooids bearing medusa-buds. Smaller, sterile gonozooids scattered for some 2 mm down the length of the polychaet tube. Gonozooids without tentacles, with a distal pad of nematocysts, bearing up to four medusae of different ages.

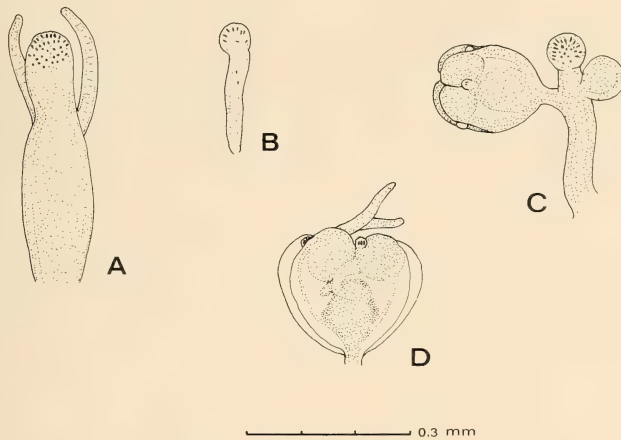


Fig. 9. *Proboscidactyla* sp.

A. Gastrozooid. B. Sterile gonozooid. C. Fertile gonozooid with medusa-buds. D. An older medusa-bud.

Medusa with four perradial marginal bulbs each bearing a hollow tentacle, four interradial nematocyst sacs (cnidothylacies), four unbranched radial canals, stomach with the beginnings of four pouches, no ocelli. Largest medusa 0,23 mm in depth and 0,26 mm in diameter.

Nematocysts of three types:

- (i) Macrobasic euryteles, $13,2-15,6 \times 6,0-6,6 \mu$. Butt coiled in four whorls in the transverse axis. Discharged capsules similar to those illustrated

by Russell, 1938, for *Lar sabellarum*. Present in the nematocyst pads of the hydranths and in the cnidothylacies of the medusae.

- (ii) Microbasic euryteles, $5,4-7,8 \times 2,1-3,0 \mu$. None seen discharged.
- (iii) Desmonemes, $3,6-4,2 \times 2,4-3,0 \mu$.

Remarks

Identification of species of *Proboscidactyla* essentially depends on details of medusa structure, and as far as the hydranths go 'there appears to be no precise way to separate the various species' (Calder 1970). Hand (1954) advocates the use of small differences in nematocysts for this purpose, but this is of little help in the present material, for although the three categories characteristic of the genus are present, all are smaller than those described for any other species.

The hydranths of five species of *Proboscidactyla* are known, namely *P. circumsabella* Hand, 1954, *P. flavicirrata* Brandt, 1835, *P. occidentalis* (Fewkes, 1889), *P. ornata* (McCrary, 1857) and *P. stellata* (Forbes, 1846) = *Lar sabellarum* (Gosse, 1857). Of these, only *P. ornata* has been reported from the western Indian Ocean (Kramp 1965: near Mombasa). The life-history of this species has been described by Brinckmann & Vannucci (1965) and by Calder (1970). There is nothing to debar the present material from inclusion therein apart from nematocyst size, and nematocyst size must be variable for there are differences between the measurements given for this species by Brinckmann & Vannucci from the Mediterranean and those given by Calder from Virginia. However, it would be unwise to make a definite diagnosis until such time as the medusa has been reared.

SUMMARY

A collection of hydroids from the Inhaca area and from Santa Carolina on the Moçambique coast, East Africa, is described. The collection includes 86 species, of which one is new to science, namely *Hydrodendron sympodiformis*, and 19 are new records for Africa south of 20° S. Lat.

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